

PRELIMINARY AMENDMENT

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. - 10. (canceled).

11. (new): A system for detecting individuals or objects in a plurality of delimited spaces each having at least one entrance, the detection system comprising, for each of the said delimited spaces :

low frequency transmission means associated with the delimited space and located at the said entrance to transmit at least one low frequency electromagnetic signal in a communication region substantially covering the said entrance; and

high frequency transmission-reception means associated with the delimited space for receiving and transmitting at least one high frequency electromagnetic signal,

the detection system further comprising:

cards or portable electronic units, each equipping an individual or object, each electronic unit comprising a low frequency reception module for receiving the said low frequency electromagnetic signal and a high frequency transmission-reception module for transmitting and receiving the said high frequency electromagnetic signal; and

at least one central processing unit associated with the said delimited spaces and connected to the said low frequency transmission means as well as to the said high frequency

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transmission-reception means for recording data relative to the entrance and exit of the said portable electronic units,

wherein the system is configured to operate according to at least two distinct modes of operation in which said electronic units communicate with said high-frequency transmission-reception means, and wherein the said low frequency electromagnetic signal comprises selection information indicating which of the said at least two modes of operation should be utilised by the said electronic units during their passage through an entrance of any one of the said plurality of delimited spaces.

12. (new): The system according to claim 11, further configured to pass, at least temporarily, from one mode of operation to another in at least one selected delimited space among the said plurality of delimited spaces.

13. (new): The system according to claim 11, wherein the said low frequency transmission means comprise first and second low frequency transmitters for transmitting first and second low frequency electromagnetic signals respectively carrying data relating to the delimited space, these first and second low frequency electromagnetic signals being respectively transmitted in first and second communication regions, spatially separated from one another and at least partially overlapping, the said first and second communication regions being situated respectively towards the outside and towards the inside of the said delimited space,

wherein each electronic unit comprises detection means for determining the direction of passage of the said electronic unit through the said entrance as a function of the reception of the said first and second low frequency electromagnetic signals,

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wherein the system is configured to operate according to a first mode of operation according to which each electronic unit proceeds to transmit, at least once, the said high frequency electromagnetic signal, the presence or absence of an electronic unit in the delimited space being determined on the basis of reception, by the said high frequency transmission-reception means of the high frequency electromagnetic signal emanating from this electronic unit,

and wherein the system is configured to function according to a second mode of operation according to which each electronic unit proceeds to detect the said direction of passage and transmits, by means of the said high frequency electromagnetic signal, information relative to the said direction of passage, the presence or absence of an electronic unit in the said delimited space being determined on the basis of the said information of the direction of passage.

14. (new): The system according to claim 13, configured to pass, at least temporarily, from one mode of operation to another in at least one selected delimited space among the said plurality of delimited spaces, wherein the said first and/or second low frequency electromagnetic signal comprises selection information determined such that the presence or absence of an electronic unit in this selected delimited space is determined according to the said second mode of operation,

and wherein the system is switched, at least temporarily, in this selected delimited space, into the said first mode of operation if the information of direction of passage determined by the electronic unit is not conclusive.

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15. (new): The system according to claim 13, configured to pass, at least temporarily, from one mode of operation to another in at least one selected delimited space among the said plurality of delimited spaces, wherein the said first low frequency electromagnetic signal comprises selection information determined such that, following an entry of an electronic unit into the said selected delimited space, the presence or absence of this electronic unit in the said delimited space is determined according to the said first mode of operation,

and wherein the said second low frequency electromagnetic signal comprises selection information determined such that, when an electronic unit leaves the selected delimited space, the system is switched at least temporarily into the said second mode of operation in case the system has previously concluded the absence of an electronic unit although this unit is still located in the said selected delimited space.

16. (new): The system according to claim 11, wherein the said first and/or second low frequency electromagnetic signals carry data comprising an indication allowing identification of the said delimited space as well as an indication of the time and the date of the passage of the electronic unit through the said entrance.

17. (new): The system according to claim 11, wherein the said delimited space is defined by a compartment of a transport vehicle, such as a bus, a railway carriage or a subway train, and in that the said first and/or second low frequency electromagnetic signals carry data comprising an indication of the station or the stop where the said transport vehicle is located.

18. (new): A method of detecting an individual or an object in a detection system according to claim 13, wherein each electronic unit further comprises:

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data processing means for processing data provided by the said low frequency reception module and/or data provided by or destined to the said high frequency transmission-reception module;

an electrical power supply source for supplying the said processing means as well as the said low frequency reception module and the said high frequency transmission-reception module,

wherein the said low frequency reception module is supplied permanently or quasi-permanently,

and wherein the said data processing means as well as the said high frequency transmission-reception module are deactivated in a so-called standby mode of the said electronic unit,

the said data processing means being activated by the said low frequency reception module when this detects one or the other of the said first and second low frequency electromagnetic signals,

the said high frequency transmission-reception module being activated when the electronic unit has to transmit and/or receive the said high frequency electromagnetic signal,

this method comprising the following steps:

a) reception by a card or electronic unit carried by the said individual or object of the said first and/or second low frequency electromagnetic signal by means of the said low frequency reception module of the electronic unit;

b) activation of the said data processing means of the electronic unit;

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- c) reading the said selection information contained in the first received low frequency electromagnetic signal, namely the said first or second low frequency electromagnetic signal, and identification of the mode of operation associated with the delimited space;
- d) if the said mode of operation corresponds to the second of the said modes of operation, detection by the said electronic unit of the said direction of passage through the entrance;
- e) activation of the said high frequency transmission-reception module of the electronic unit; and
- f) if the said mode of operation corresponds to the second of the said modes of operation, transmission, after the passage through the said entrance, of the said high frequency electromagnetic signal comprising the said information of direction of passage by means of the said high frequency transmission-reception module,
 - otherwise transmission, at least once, of the said high frequency electromagnetic signal by means of the said high frequency transmission-reception module awaiting a reception acknowledgement provided by the said high frequency transmission-reception means; and
- g) if the said mode of operation corresponds to the second of the said modes of operation, return of the electronic unit into its standby mode and deactivation of the said data processing means and of the said high frequency transmission-reception module, and
 - if the said mode of operation corresponds to the first of the said modes of operation, return of the electronic unit to its standby mode and deactivation of the said data processing means and of the said high frequency transmission-reception module if no reception

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acknowledgement is received during a predetermined period of time, otherwise repetition of the transmission of the said high frequency electromagnetic signal until no acknowledgement of reception is received during the said predetermined period of time.

19. (new): The method of detection according to claim 18, wherein the detection system is configured to pass, at least temporarily, from one mode of operation to another in at least one selected delimited space among the said plurality of delimited spaces,

wherein the said first and/or second low frequency electromagnetic signal comprises selection information determined such that the presence or absence of an electronic unit in this selected delimited space is determined according to the said second mode of operation,

wherein the system is switched, at least temporarily, in this selected delimited space, into the said first mode of operation if the information of direction of passage determined by the electronic unit is not conclusive,

and wherein, if the said information of direction of passage determined by the electronic unit in step d) is not conclusive and it is not possible to determine in an unequivocal manner whether the electronic unit is located inside or outside the said delimited space, the said electronic unit is then switched at least temporarily into the said first mode of operation.

20. (new): The method of detection according to claim 18, wherein the detection system is configured to pass, at least temporarily, from one mode of operation to another in at least one selected delimited space among the said plurality of delimited spaces,

wherein the said first low frequency electromagnetic signal comprises selection information determined such that, following an entry of an electronic unit into the said selected

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delimited space, the presence or absence of this electronic unit in the said delimited space is determined according to the said first mode of operation,

wherein the said second low frequency electromagnetic signal comprises selection information determined such that, when an electronic unit leaves the selected delimited space, the system is switched at least temporarily into the said second mode of operation in case the system has previously concluded the absence of an electronic unit although this unit is still located in the said selected delimited space,

and wherein, if the said electronic unit is in standby mode and if the first low frequency electromagnetic signal received by the said low frequency reception module in step c) corresponds to the said second low frequency electromagnetic signal, the said electronic unit is then switched at least temporarily into the said second mode of operation.